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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/659,181 | 09/10/2003 | Greg E. Howard | TI-36332 (032350.B531) | 7485 |
| 23494 | 7590 | 04/05/2006 | EXAMINER | |
| TEXAS INSTRUMENTS INCORPORATED | | | CLARK, SHEILA V | |
| P O BOX 655474, M/S 3999 | | | ART UNIT | |
| DALLAS, TX 75265 | | | PAPER NUMBER | |

2823

DATE MAILED: 04/05/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/659,181

Applicant(s)

HOWARD ET AL.

Examiner

S. V. Clark

Art Unit

2823

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 6-10-2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-4,7,8 and 15-22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4,7,8 and 15-22 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☐ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: _____

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-4, 7, 8, 15-22 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Ohno et al.

Ohno et al shows in for example figures 9-11 providing a substrate 40 having a plurality of through holes 24 formed therein with each hole associated with a plurality of contact pads 2 in the form of leads 2 formed on a first bottom surface. A plurality of balls 6 are taught disposed within ones of the plurality of holes and projecting outward from said first surface (Figure 10B). A force 53 (a press) is shown in figure 10 applied to each of the balls outwardly from the first surface to couple the balls to the substrate 40 (figure 10D).

Example 2 of Ohno et al teaches that the bumps may be dropped in the recesses but fails to be specific relative to a bottom up or top down orientation. Ohno et al therefore appears to obviously provide flexibility relative to what surface of the substrate said balls may be disposed.

Col. 11, line 31 describes substrate 40 as being formed of a pile of layers would have been to one having ordinary skill in this art to be obviously describing a laminate, used common in semiconductor substrate technology.

Figure 10C shows said formed applied to each of said balls (simultaneously) and a press tool is taught wherein press may be used interchangeable as a punch and as pressing tools may punch.

Further Ohno et al teaches the process of thermal compression bonding which would includes a heating step that heats the pressing tool (see col. 4, lines 17-19). Further the as the claims fail to recite a specific process for heating said tool said tool would inherently by heated by the ambient temperature.

It is taught that that said balls are pushed through a substrate such that a portion extends outside said through hole. As the balls are taught to have a diameter of 90 the holes 80 and the substrate 40 micrometers it would seem that there would be some overlap of the protruding portion of the balls relative to the substrate.

Col. 12, line 34 teaches that said ball may project outwardly by a distance of 45 microns in the range recited in claim 4.

Claims 1-4, 7, 8, 15-22 are rejected.

Applicant's arguments filed 12-1-05 have been fully considered but they are not persuasive. The amendments to the claims have been considered but Ohno et al appears to provide flexibility in his invention for disposing the balls on a first or second surface of the substrate. Further Page 6, paragraph 3, states that said ball may be disposed within holes using any suitable method and further goes on the express only an example method of the many methods that may be used. Therefore the amended features in the claims such as "disposing a plurality of balls on a second surface of the substrate different from the first surface" does not appear to be taught in the instant


specification to be critical. Addressing applicant's argument on page 3 of the remarks, the two sequential steps are taught by Ohno et al in for example figure 2. Also although for claim 1 of the instant invention recites a substrate having contact pads there is no recited relation between said balls and said contact pad recited in process. Claim 1 fails to connect a ball to said contact pad.

Applicant is invited to call the examiner so that applicant may consider suggested claim amendments that will be suggested by the examiner that may allow said claims to be further considered for allowance.

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication should be directed to S. V. Clark at telephone number (571) 272-1725.


S. V. Clark
Primary Examiner
Art Unit 2823

March 31, 2006